CLAIMS

WHAT IS CLAIMED IS:

1. An offset compensating device comprising:

a deviation monitor unit which generates a vector signal by A/D-converting the vector sum of the results of processings applied to two quadrature AC signals individually in response to an input signal and further quadrature-demodulating a result of the A/D-converting, and which monitors the deviation of the DC components superposed on the vector signal; and

an adaptive control unit which updates a compensation vector determined in advance, on the basis of an adaptive algorithm to minimize the expectation value of the product of the inner product between an increment vector indicating the increment of said deviation in the order of time series and the compensation vector, and the latest deviation vector indicating the deviation, and which adds the compensation vector to an offset vector to be inputted, while being superposed on said input signal, to a circuit to output said vector sum.

2. An offset compensating device comprising:

a deviation monitor unit which creates a vector signal by A/D-converting the vector sum of the results of processings applied to two quadrature AC signals individually in response to an input signal and by quadrature-demodulating and which monitors the deviation of the DC components superposed on the vector signal; and

an adaptive control unit which determines a compensation vector on the basis of an adaptive algorithm to minimize the expectation value of the product of the inner product between said input signal and said vector signal and an increment vector indicating the increment of said deviation in the order of time series, and which adds the compensation vector to an offset vector to be inputted, while being superposed on said input signal, to a

circuit to output said vector sum.

3. The offset compensating device according to claim 1, wherein:

the adaptive control unit updates the compensation vector determined in advance, on the basis of the adaptive algorithm to minimize the expectation value of the product of the sum of the inner product in a vector space between the increment vector indicating the increment of said deviation in the order of time series and the compensation vector, and the latest deviation vector indicating the deviation, and which adds the compensation vector to an offset vector to be inputted, while being superposed on said input signal, to the circuit to output said vector sum.

4. The offset compensating device according to claim 2, wherein:

the adaptive control unit which determines the compensation vector on the basis of the adaptive algorithm to minimize the expectation value of the product of the sum in a vector space between the inner product of said input signal and said vector signal and the increment vector indicating the increment of said deviation in the order of time series, and which adds the compensation vector to the offset vector to be inputted, while being superposed on said input signal, to the circuit to output said vector sum.

5. The offset compensating device according to claim 1, wherein:

the adaptive control unit subtracts from said vector signal the inner product between the increment vector indicating the increment of said deviation in the order of time series and the compensation vector determined in advance, which updates the compensation vector on the basis of the adaptive algorithm to minimize the expectation value of the latest deviation vector indicating the deviation, and which adds the compensation vector to the offset vector to be inputted, while being superposed on said input signal, to the circuit to output said vector sum.

6. The offset compensating device according to claim 2, wherein:

the adaptive control unit which subtracts the inner product between said input signal and said vector signal from said vector signal, which updates the compensation vector on the basis of the adaptive algorithm to minimize the expectation value of the latest deviation vector indicating the deviation, and which adds the compensation vector to the offset vector to be inputted, while being superposed on said input signal, to the circuit to output said vector sum.

7. The offset compensating device according to claim 1, wherein

said deviation monitor unit generates said vector signal by A/D-converting the result of processing applied to said vector sum and by performing a processing inverse to the processing in a digital area and then performing a quadrature-modulation.

8. The offset compensating device according to claim 1, wherein

said adaptive control unit determines an inner product of two vectors which make a common angle with respect to all axes of the vector space in a quadrant in the vector space where the two vectors to be determined in their inner product are individually positioned and which have a common absolute value.

9. The offset compensating device according to claim 1, wherein

said adaptive control unit sets a step size μ to be applied to said adaptive control, to the larger value as said deviation is the larger.

10. The offset compensating device according to claim 1, wherein

said deviation monitor unit smoothes said DC component the more over a short section as the deviation determined in advance is the larger, thereby to obtain the deviation as the result.

11. The offset compensating device according to claim 1, wherein

said deviation monitor unit smoothes said DC component the more on the basis of the weight having the larger changing rate to time series, as the deviation determined in

advance is the larger, thereby to obtain the deviation as the result.

12. The offset compensating device according to claim 1, wherein

said adaptive control unit acts intermittently at a frequency for said compensation vector to be updated.

13. The offset compensating device according to claim 1, wherein

said adaptive control unit stops when the deviation determined in advance becomes lower than a predetermined lower limit.

14. An offset compensating device comprising:

a demodulator which generates two monitor signals by A/D-converting a modulated wave generated through two D/A converters individually corresponding to two quadrature channels and through a quadrature modulator arranged at the downstream stage of those D/A converters, and by quadrature-demodulating the converted wave;

an intermission control unit which intermits the feed of said modulated wave to said demodulator; and

a control unit which suppresses an imbalance of said quadrature modulator by extracting composite DC components individually contained in said two monitor signals for the period while said modulated wave is being fed, by extracting excess DC components individually contained in said two monitor signals for the period while said modulated wave is not fed, and by feeding back the difference for every said two channels between those composite DC components and excess DC components , individually to said two D/A converters.

15. An offset compensating device comprising:

a demodulator which generates two monitor signals by frequency-converting, A/D-converting and quadrature-demodulating a modulated wave generated through two D/A converters individually corresponding to two quadrature channels and through a

quadrature modulator arranged at the downstream stage of those D/A converters;

a local-frequency control unit which sets the frequency of the local-frequency signal fed for said frequency conversion, at a predetermined value F and at a value (= F $\pm$ Δf) different from the predetermined value F; and

a control unit which suppresses an imbalance of said quadrature modulator by determining excess DC components individually contained in said two monitor signals for the period while the frequency of said local-frequency signal is different from said predetermined value F, by determining composite DC components individually contained in said two monitor signals for the period while the frequency of said local-frequency signal is at said predetermined value F, and by feeding back the difference for every said two channels between those composite DC components and excess DC components , individually to said two D/A converters.

16. The offset compensating device according to claim 15, further comprising:

a frequency control unit for keeping said value Δf is kept at (fmax - fc) or more or (fmin - fc) or less, for the maximum and minimum frequencies fmax and fmin of the occupied band of said modulated wave and for the frequency fc of the carrier signal contained in said modulated wave due to said imbalance.